San Juan and New York Mining and Smelting Company, Smelter Stack
On State Route 160
Durango
La Plata County
Colorado

HAER No. CO-38

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
Rocky Mountain Regional Office
National Park Service
Department of the Interior
P.O. Box 25287
Denver, Colorado 80225

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HISTORIC AMERICAN ENGINEERING RECORD

San Juan and New York Mining and Smelting Company, Smelter Stack

HAER No. CO-38

Location: On State Route 160
Durango, La Plata County, Colorado

UTM: 13.244.100E 41.27.810N
Quad: Durango West

Date of Construction: 1880-1881

Present Owner: Hecla Mining Company
Box C-8000
Coeur d'Alene, Idaho 83814-1931

Present Use: The smelter site has been abandoned since 1963, except for routine maintenance operations on the tailings piles. Radioactive contamination of the site and its remaining structures, resulting from uranium processing in the 1940s, 1950s, and 1960s, has made the site eligible for Department of Energy remedial action, which consists of decontamination and stabilization at another location. Removal and stabilization of the site's structures, tailings piles and adjacent soils is scheduled to begin in early 1987.

Significance: The extant smelter stack is the first of two identical stacks at the San Juan and New York Mining and Smelting Company (SJ&NY) plant in Durango, Colorado. It stands at the south end of the site of the original plant. SJ&NY grew to become the largest smelting operation in the San Juan Mountain mining region, originally processing gold, silver, lead and copper primarily for eastern manufacturing concerns. Beginning in the 1940s, the plant processed uranium for World War II research in Los Alamos, New Mexico, and post-war security programs. The stack, as part of the original smelter's operations, played a significant role in the industrial development of Durango and southwest Colorado.

Historian: James A. Caufield
Caufield*Caufield
December 1986

Edited, Retyped and Transmitted by: Jean P. Yearby, HAER, 1988

I. HISTORY

The 1880-1881 brick and stone smelter stack is located at the base of Smelter County in Durango, Colorado, and is one of only two surviving structures of a late 19th century complex ore smelting site (the other being the superintendent's house [see HAER No. CO-38-A]). By 1883, the site had two matching stacks, the second having been built as part of the plant's first major expansion. Since the stack is an integral part of the early smelter complex, understanding its significance must consider the early mining activities in the San Juan Mountains in southwest Colorado, and the development of the San Juan and New York Mining and Smelting Company and its successors.

The San Juan Mountains have supported mining activities since early Spanish occupation of the area. Smelting, the processing of separating the metallic constituents from mined ores, predictably became a necessary industry to this area rich in silver, gold, lead and copper deposits. As early as the 1870s, smelting facilities began appearing in various mining camps and areas throughout the San Juan Mountains. Their capacity was small, however, and not capable of supporting the major mining industry that was to develop in the late 1800s. Two significant reasons for the poor production of these early smelters were the severe winter climate and the lack of a transportation system connecting the mining communities throughout the rugged mountain terrain. Records show that sending ore to smelters in Pueblo and Denver, Colorado, was often cheaper and easier than using the few existing area facilities.

The 1880 construction of the Denver and Rio Grande Railroad (DR&G) into the newly-established railroad center of Durango provided the first major transportation service into the region. The D&RG, in combination with the simultaneous construction of railroad lines from Durango into the mining camps, immediately placed Durango in a position of becoming a regional smelting center. Another factor that ultimately contributed to the development of Durango's smelting industry was D&RG President William J. Palmer's desire to integrate his interests in the railroad, the Colorado Coal and Iron Company, in extensive coking coal deposits near Durango, and in various regional mines, in order to increase revenues for the railroad. To achieve these goals, Palmer and his associates organized the San Juan and New York Mining and Smelting Company (SJ&NY). In 1880, they purchased the existing Silverton Smelting Works (1874) in Silverton, Colorado, about 50 miles north of Durango, and also began purchasing additional mines, coal deposits in the Animas River Valley, south of Silverton, and a limestone quarry near Durango. SJ&NY had positioned itself to provide everything necessary for its smelting operation except the mined ore. In spite of the ambitious efforts of SJ&NY, the Silverton smelting operation proved unsuccessful, due to its relatively small size (10 ton daily capacity), severe winter weather, and the poor regional transportation system.

Prompted by these troubles, and because of the advantages of Durango, SJ&NY decided to relocate its smelting operation to the new railroad center. Durango's advantages over Silverton included its close proximity to the mines of the Animas, Iron Spring and Rico mining districts, its easy outlets to the south, north and west, and its closer proximity to the SJ&NY-owned coal, limestone and other holdings. Relocated involved the construction of a new smelter facility in Durango. Success of this new facility was considered guaranteed once the railroad construction was completed between Durango and Silverton, making Silverton ores readily accessible.

SJ&NY purchased a parcel of land immediately west of the Durango townsite, on the west bank of the Animas River and at the foot of what was to be known as Smelter Mountain. Construction of the new works began in late 1880, under the direction of John A. Porter, SJ&NY general manager; Ernest Waters, engineer in charge of construction; Captain Stanley, superintendent of brick and stone work; and Don Fisher, superintendent of carpentry work. The original construction site was to cover an area of 100 feet by 500 feet[1] and, according to an 1893 account, initially consisted of one blast furnace and stack, two reverberatory furnaces and eight beehive coke ovens. The plant was capable of treating 25 tons of ore per day. A brick office building accommodated the general manager, a general office, an assay room and a laboratory. The smelter was constructed to treat all types of ore and the first furnace was 'blown in' on April 16, 1881.

The railroad line from Durango to Silverton was completed in 1882 and, in 1883, the smelter was described as "...running smoothly, producing 5 tons of bullion per day."[2] In its first two years of operation, the smelter had treated 2,300 tons of ore, producing $220,000.00 worth of bullion. Improvements to the plant in 1883, included a new 30-ton blast furnace and stack, and the installation of new railroad lines onto the site. The new stack was constructed to the north of, and to match, the original stack. By this time, the plant supported 40 fulltime employees and had established itself as Durango's largest employer--a status that would remain throughout most of its history. An 1893 pamphlet described that the fumes of the plant "...are carried off through two large stacks each 136 feet in height..."[3] By 1887, plans called for doubling the smelter's capacity, in order to adequately handle the ores anticipated from the soon-to-be-completed railroad line from the Rico mining district to the northwest. By the end of 1887, over $1,000,000.00 worth of bullion had been treated, making the SJ&NY works the ninth largest in Colorado and the largest in the San Juan Mountain region. The SJ&NY operated the Durango smelter until 1888.

A reorganization of the SJ&NY in 1888 transferred ownership to the San Juan Smelting and Mining Company, bringing fresh management and financial input to the operation. Between 1888 and 1893, the plant grew

to its largest size and ore treating capacity, in spite of slowdowns in Silverton's mining production and falling silver prices. During this period, employment had risen to 300 fulltime employees at the smelter works, with an additional 17 employees at the coke ovens alone. Durango had become a business, transportation, cultural and banking center, and was known as the "Smelter City."[4] In 1892, 12,000 oz. of gold, 1,500,000 oz. of silver, 6,000,000 lbs. of lead and 1,089,552 lbs. of copper bullion were shipped from the plant. By the end of 1893, the operation consisted of six blast furnaces treating 300 tons of ore per day, five boilers, power crushers and samplers, six blowers, 10 reverberatory furnaces, 40 beehive coke ovens, and various support facilities including a water distribution system, electric light plant and a brick residence for the plant superintendent. The plant maintained these basic components until the early 1940s.

The continuing Silverton mining slowdown, coupled with the worst depression of the century in the winter of 1893, resulted in a mining crash from which the smelter was not able to recover. The plant closed in 1894, after letting 400 employees go. It remained closed until 1895, when it was leased by the Omaha and Grant Smelting Company (OGS) of Denver. OGS purchased the property in late 1895, only to be absorbed by the American Smelting and Refining Company conglomerate in 1899. Although the smelter continued to process local ores, labor disputes, mining slowdowns and the Depression of 1929, caused to plant to close again in November 1930. Following this shutdown, up until 1942, most of the original buildings were razed. The original smelter stack was retained, presumably with the hope of its reuse later.

The site remained vacant and inoperative until 1942, when World War II created a demand for vanadium, a steel hardener found in carnotite ore, for military equipment production. In 1942, the U. S. Vanadium Corporation (USV) leased the property and rebuilt a smaller facility, supported by about 50 employees, for vanadium processing under contract with the Department of the Army. In 1943, USV, under contract with the Atomic Energy Commission (AEC), began reprocessing the vanadium tailings to extract uranium, also a component of carnotite ore. This production was supplying the Manhattan Project at Los Alamos, New Mexico, approximately 230 miles southeast of Durango. This period of uranium processing lasted until 1945. Again, the plant was closed, this time until 1948.

Under a new lease agreement, the Vanadium Corporation of America (VCA) reopened the smelter in 1948, under an AEC contract to produce uranium concentrate for post-war security efforts. VCA purchased the property in 1953, and continued reprocessing the existing vanadium tailings in addition to processing ore from VCA-owned mines on the far western slope of the Rocky Mountains and from other mines in the San Juan Basin. This effort lasted until 1963, employed 200 workers, and helped create

a post-war boom in Durango. During the 14 years VCA processed uranium for the AEC (1949-1963), approximately 1,600,000 tons of uranium ore were processed in Durango.[5] In 1963, when the plant closed, the site was largely razed, again except for the remaining smelter stack and superintendent's house.

VCA merged with the Foote Mining Company in 1967, but the site was not to be active again. In 1976, the property was purchased by the Albuquerque, New Mexico-based Ranchers Exploration and Development Corporation (REDC), which was merged into Hecla Mining Company in 1984. REDC purchased the property to reprocess the tailings again, but was never able to receive the required state licenses necessary for the work. In 1976, a stabilizing grass cover was planted on the tailings piles, and the site has simply been maintained.

II. DESCRIPTION

A. Site

The site of the 1880 smelter is an approximately 147-acre tract located on the west side of Durango, on the west bank of the Animas River, and at the foot of Smelter Mountain. The elevation of the smelter site is approximately 6,500 feet above sea level. Two tailings piles, resulting from the milling and smelting operations of the 1940s, 1950s and 1960s, abut the base of the mountain, covering approximately 1,230,000 tons of tailings, and the other being 90 feet high and containing approximately 325,000 tons of tailings.[6] Because of the steepness of the tailings piles and slopes varying from 2:1 to 1.5:1, grass has been planted on the piles in a somewhat successful stabilization attempt. The only extant structures on the site relating to the earlier smelting facilities are the 1880-1881 stone and brick smelter stack and the c. 1890 brick superintendents house.

B. Smelter Stack

The remaining smelter stack stands to the south of the large tailings pile. All of the structures that originally surrounded the remaining stack have been razed and the context of the stack to the original smelter plan and later operations no longer exists. A later utilitarian (date unknown), a concrete block lunchroom structure stands east of the stack's pedestal. The stack is entirely of brick and stone construction and is composed of four distinct parts: the stone pedestal, the brick base, the brick shaft, and the brick shaft extension.

The **stone pedestal,** the lowermost part of the stack, is a 20-foot rusticated sandstone, hollow pedestal that tapers in approximately 2 percent up to the brick base and has an arched opening on the northwest side. Because of the stack's location at the base of the mountain, the exposed height of the pedestal varies from approximately eight feet on the southwest and southeast to approximately 23 feet on the northeast and northwest. An 1883 newspaper describes the smelter plant as "...very strongly built on deep stone foundations..."[7] Test trenching at the northeast pedestal based, performed in 1986, revealed the stone pedestal walls, continuing below grade to a depth of 12-1/2 feet. A deeper foundation may exist, but no evidence has been located to verify its details or dimensions. The pedestal's stone blocks are approximately 12 inches high by 13 inches deep and vary in length from 36 inches to 12 inches. The corners of the stones at the north, east and south corners of the pedestal are dressed smooth. The stone blocks are laid with 1-1/2-inch mortar joints with a 1/4-inch convex strike in the center of each joint. The walls of the pedestal are approximately 5-1/2 feet thick and appear to be solid stone with an interior lining of 2 by 2 by 8-inch bricks. The entry into the stack is an arched opening through the pedestal on the northwest side. This opening is approximately 8 feet wide and 10 feet high to the top of the arch. The arch is finished with three brick header courses. The floor of the pedestal is approximately five feet below the bottom of the opening. The stone of the pedestal is in good condition with some deteriorated mortar joints.

A rubble stone retaining wall, the full height of the pedestal, extends northwest from the west corner of the pedestal. Because the retaining wall is not keyed into the stone of the pedestal, and because of its crude construction, it is assumed to postdate the construction of the stack. The date and exact purpose of the retaining wall are not known.

The **brick base** of the stack is hollow and roughly cubic, with a taper matching that of the pedestal. The base is composed of 54 courses of brick laid in common bond with headers every sixth course, and is approximately 18 feet high. The walls of the base are set back four inches from the face of the pedestal below. Starting at the thirteenth course are recessed corner panels with corbelled tops. The brick of the base, in addition to the rest of the stack, is laid with narrow, slightly recessed mortar joints. A portion of the brick, approximately 2 feet by 4 feet, has fallen from the base at the intersection of the south corner of the base and shaft. There are also several substantial continuous cracks on the southeast side.

The **brick shaft,** with pilasters, extends approximately 90 feet above the base and continues at the same taper. The shaft is laid in common bond with headers every eighth course. Double pilasters, each approximately 20 inches wide, project from each face of the shaft approximately 4 inches, the face of the pilasters being a continuation of the tapered plane of the base walls below. The top four courses of the 90 foot pilasters taper into the plane of the shaft. An elaborate corbelled capital began at this point on the original 1880 stack. Early photographs and drawings show this original capital composed of approximately 15 brick courses. The original capital was removed in 1942 to construct a stack extension, in an effort to slow or stop the damaging occurring to the vegetation of the adjacent hillside from the stack's acid smoke, a problem observed as early as 1892. The main shaft is in good condition except for approximately three square feet of brick on the southeast face, which is separating from its substrate.

The 1942 **brick shaft extension** extends approximately 63 feet above the main shaft, without taper or pilasters, making the entire stack approximately 195 feet high above the ground on the northeast. The brick of the extension, while of the same size as the original brick, is noticeably redder in color. The bonding of the extension also changes to common bond with headers every seventh course. The extension ends at the top of the stack with three corbelled courses and five common bond course, the first and last being headers. Metal flashing has been attached to the top perimeter of the stack opening, and extends down the outside faces of the stack approximately 8 inches. An area of face brick on the south corner, approximately four feet by 36 feet has spalled off, exposing the substrate brick. Otherwise, the shaft extension and cap appear to be in good condition.

III. STATUS OF PROPERTY

Because of the carnotite processing that took place at the smelter during the 1940s, 1950s, and 1960s, the site accommodates two piles of radioactive tailings. In 1978, the Durango site was determined eligible for remedial action under the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). This determination was made by the Department of Energy (DOE), the agency authorized to coordinate remedial actions to bring radiation levels of eligible sites within standards established by the Environmental Protection Agency (EPA). A DOE-prepared environmental impact statement for the Durango site included the preferred remedial action alternative of decontaminating the site and structures, and stabilizing the contaminated materials at a site in Bodo Canyon, on the west side of Smelter Mountain. This alternative required the demolition of the site's remaining structures.

In September 1984, the Colorado State Historic Preservation Officer (COSHPO) determined that the 1880 smelter stack was eligible for listing in the National Register of Historic Places (NRHP) under NRHP evaluation criteria A, "...for its association with the industrial development of Durango."[9] At the same time, the COSHPO determined that the superintendent's house was not eligible for NRHP listing because it "...is not a distinctive example of a type, period or method of construction and is not the best representative structure associated with this industrial complex."[10]

Decontamination and preservation of the stack, in situ, was considered not feasible by DOE because of safety and cost concerns, and decontamination processes that would jeopardize its architectural and structural integrity.[11] Therefore, demolition was considered the only feasible course of action. Demolition of the stack is planned for early 1987,[12] as part of the entire site's decontamination and stabilization. DOE proposed to archivally document the stack according to Historic American Engineering Record (HAER) standards to mitigate the adverse effect of razing the structure. The level of documentation necessary to conform to HAER standards was specified by the National Park Service, Rocky Mountain Regional Office, Denver, Colorado.

IV. FOOTNOTES

1 Durango Record, January 10, 1881, p. 4.

2 The Southwest, February 3, 1882, p. 4.

3 Board of Trade, Durango Metropolis of the Great Southwest, Durango, 1893.

4 Ibid.

5 U. S. Department of Energy, Engineering Assessment of Inactive Uranium Mill Tailings: Durango Site, Durango, Colorado, by Ford, Bacon and Davis Utah, Inc., unpublished report, Salt Lake City, 1981, pp. 1-7.

6 Ibid.

7 Board of Trade, Durango, Durango: Herald Steam Printing and Publishing Co., 1883, p. 16.

8 Duane A. Smith, Rocky Mountain Boom Town: A History of Durango, Albuquerque: University of New Mexico Press, 1980, p. 39.

9 U. S. Department of Energy, Preliminary Case Report of the Durango Smelter Stack, unpublished report, Albuquerque, 1986, Attachment D.

10 Ibid.

11 Ibid., Attachment C. An analysis of the stack made October 3, 1986, by P. M. Viarnes at the request of DOE, resulting in an estimate of $700,000.00 to $1,200,000.00 for decontamination and preservation of the stack, in situ. In addition, the only procedures available for decontamination of radioactivity, acceptable to EPA standards, were considered in direct violation of Secretary of the Interior's Standards for Historic Preservation number 7, i.e., sandblasting and strong acid washing.

12 A Durango citizen's committee, formed in 1986 to consider ways to save the stack, developed a series of options that would preserve the stack as a Durango landmark. The stack's radioactive contamination, proximity to the tailings removal operation, overall structural integrity and ownership are among the considerations being addressed as part of a preservation program. Final conclusions and recommendations from the local group regarding the stack's future had not been made by the time this documentation report was prepared.

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The Southwest, June 6, 1883.